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From street to satellite: Mixing methods to understand mobile money users

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How do users incorporate mobile money into their existing practices and adapt it to their needs? The answers can be surprising. Simultaneously a commodity, a store of value, and a social good, mobile money combines a large array of applications within the one platform. This is why mobile money has been touted for its potential for socioeconomic development, as a profitable commercial enterprise, and even as a tool for strengthening governance. The fact that customers rarely use it for just one purpose can also make it difficult to untangle customers' motives and behaviors. In this paper we compare our own research with other studies to demonstrate how deploying a full suite of ethnographic methods (qualitative and quantitative) can provide significant insights into users. We present three key insights relating to time, trust, and traces / trajectories, and make suggestions for the future of mobile money research.

INTRODUCTION

A forty-something-year-old male, dressed in a snappy suit, glances at his watch as he enters his office building. Settling behind his desk, he gazes at a photograph and smiles. He picks up his mobile phone and selects "M-PESA" and "Send money" from the Safaricom menu. Banknotes begin to stream out of the phone and travel through the air and into a rural Kenyan field. An elderly woman, dressed in a pink blouse and a purple headscarf, pulls out her phone and smiles, showing it to a man standing next to her. We, the television audience, imagine that these are the peasant parents of the city worker. The camera zooms in on the phone's screen so that we can see that the woman has just received 1,000 Kenyan shillings (US$12). She jovially heads into an M-PESA outlet and withdraws the cash as a voice-over tells us that M-PESA is a safe and reliable way to send money. Throughout the advertisement, a catchy jingle sings the service's praises.

Approximately twelve thousand kilometers away in Haiti, another elderly woman, wearing a white house dress and a red headscarf, checks her cash savings kept in different parts of her home. She extracts Haitian gourdes from a jar on top of the cupboard. She puts some in a cloth under her sofa, and stores others in the toes of a pair of yellow shoes. A voice-over tells us that this woman's problem is that the money she keeps around the house for emergencies has been going missing. Unsatisfied with her new domestic hiding places, she has decided to keep her cash in a safer place: her TchoTcho Mobile account. She visits

an outlet and deposits her money, and we are told that her savings will stay safe–and out of reach of her pilfering grandson–even if her phone is lost or stolen.

Mobile money is now available in 75 countries around the world (GSMA Mobile Money Tracker). It is viewed as one of the most novel innovations of mobile media platforms, as it allows people to store and send small amounts of money at low cost from their own mobile phones using SMS (Maurer 2012; Ratan 2008), without the need for a bank account, Internet connection, or a smart phone. Since it was first developed, mobile money has been touted as a fast and convenient alternative to expensive remittance services (see Donovan 2012; CGAP 2009), as a way to "bank the unbanked," and as a "product for the poor" (Kendall et al 2012; Maurer 2011; Mas and Morawczynski 2009) for the three-quarters of the world's population who lack access to a formal bank account (World Bank 2012).

However, in the hands of users,[1] mobile money is far more than a tool for socioeconomic development. As Digicel's advertisement indicates, customers use mobile money for a range of purposes that are specific to their circumstances. Simultaneously a commodity and a social good, mobile money is attractive to a broad range of users and applications. "Me2Me" transactions (Taylor, Baptiste and Horst 2011), conditional cash payments, merchant payments, payment of public servants' wages, financial accounting, and playing online games are among common uses of mobile money. How can we understand the adoption and adaptation of mobile money when there seem to be as many applications as there are users?

Given that mobile money can be put to many uses simultaneously, it may be better viewed as a *platform* that enables all kinds of economic and social practices (Kendall et al 2012). In this paper we draw upon our research in Haiti and other research from around the globe to suggest some of the many ways in which mobile money can be approached and investigated. We share three key insights from our research–time, trust, and traces / trajectories–that have grown out of the collation of different kinds of data. We demonstrate how mobile money lends itself particularly well to taking on the full suite of possibilities of ethnography, including both qualitative and quantitative methods.

GLOBAL MOBILE MONEY

The term "mobile money" refers to any mobile phone-based system that provides users with basic banking capabilities, namely storing value, converting cash to and from stored value, and transferring stored value between accounts (Donner and Tellez 2008). Some of the earliest mobile money services were basic m-payment systems. Celpay, for example, was launched in Zambia in 2002 to reduce the need for people to carry cash. Initially only allowing airtime top-up, Celpay is among numerous providers that have expanded their services to include cash-out and transfer capability. In the Philippines, SMART Money (launched in 2001) originally provided discounted phone credit top-ups from virtual

[1] We take a broad definition of "users," including individuals and businesses, in recognition of the fact that in informal economies it is often difficult, and analytically misleading, to separate customers from merchants.

accounts, and extended the service to incorporate the full range of mobile money features. Arguably the most successful mobile money system to date is Safaricom's M-PESA, which offered value storage, cash-in and cash-out, and transfers from the start. M-PESA was launched in Kenya in March 2007. It is now offered in Tanzania, Afghanistan, South Africa, and India (where it operates under the name M-Paisa). Today, there are 192 mobile money deployments in 75 countries (GSMA Mobile Money Tracker).[2]

The majority of research on mobile money has been carried out in Africa, which is unsurprising given that it hosts more than half of all mobile money deployments. However, studies in other areas, such as Asia and South/Central America, are becoming more common. Most studies have been small and carried out in one single country, using observation, interviews, and/or surveys with a few dozen to a few hundred people. Large, single-country surveys (>1000 respondents) have included InterMedia in Haiti (2011) and Uganda (2012); Jack *et al* in Kenya (2013), Okoegwale in Nigeria (2011), and CGAP in the Philippines (2009). Cross-country comparative studies have been less common. Teams that have conducted comparative research in more than one country include Medhi, Ratan and Toyama (2009), who examined uptake and illiteracy among 90 interviewees in India, Kenya, the Philippines and South Africa. A collaboration between Gallup and the Bill & Melinda Gates Foundation (Godoy et al 2012) drew upon Gallup World Poll data that included a subset of thirty questions to analyze mobile money usage for payments in sub-Saharan Africa. Additionally, there is a significant body of literature that conducts cross-country analysis by drawing upon existing data and literature (see Diniz et al 2011; Flores-Roux and Mariscal 2010).

MOBILE MONEY IN HAITI

Mobile money services fill a significant gap in the provision of financial tools to the majority of Haiti's population. According to GSMA's Mobile Money Deployment Tracker, formal banks have just 15 percent penetration in Haiti, and most bank branches are concentrated in the capital city. Furthermore, people can spend hours lining up outside a bank to make a simple transaction (Baptiste, Horst and Taylor 2010). When Haiti experienced a 7.0 magnitude earthquake on January 12, 2010, banking solutions became all the more pressing. Widespread damage to financial, communications, and transport infrastructure crippled Haiti's underdeveloped financial system. Given that mobile phone infrastructure recovered quickly after the earthquake, mobile money provided an alternative means for NGOs and others to pay staff and deliver aid, such as through conditional cash payments.

On June 10, 2010, six months after the earthquake, the Bill and Melinda Gates Foundation and the USAID-funded Haiti Integrated Finance for Value Chains and Enterprises (HIFIVE) announced the launch of the Haiti Mobile Money Initiative (HMMI)

[2] Mobile money services are located in Africa (36 countries), the Middle East (5 countries), Eurasia (2 countries) Asia (13 countries), the Pacific (3 countries) South America (9 countries), Central America (4 countries), North America (1 country), and the Caribbean (2 countries).

to stimulate the development of mobile banking services in Haiti (HIFIVE 2010). The HMMI offered $10 million in prizes and $5 million in technical assistance for companies to develop and expand mobile banking services across the country.

As 2010 drew to a close, there were two publicly available mobile money services in Haiti: Digicel's TchoTcho Mobile and Voilá's T-Cash. The two services were very similar in what they offered and in their pricing structures. Since Voilá's acquisition by Digicel in April 2012,[3] only one mobile money service operates in Haiti, Digicel's TchoTcho Mobil. It permits customers (both Haitians and foreigners) to deposit, withdraw, and transfer money using SMS-based menus. It offers a mini-wallet, which holds up to 4000 gourdes (USD$92.27) (raised from an initial size of 2500 gourdes). To register, all customers need to do is access the TchoTcho Mobile menu by dialing *202# and choose the registration option. To open an account with a full wallet, which holds up to 10,000 gourdes (USD$250), customers need to present identification at an official mobile money agent (called *Agent Authorisé*).

A mobile money agent can be any registered business, such as a grocery store, beauty salon, cybercafé, restaurant, or even a mechanic. They undergo training and receive a phone with a special SIM card that they use to conduct cash-in and cash-out transactions. Larger businesses that have computers and a reliable Internet connection can use software instead. Mobile money agents are normally small- to medium-sized enterprises (SMEs), with Digicel stores and the microcredit institution Fonkoze also operating as both agents.

On January 10, 2011, Digicel's TchoTcho Mobile was awarded a $2.5 million "First to Market" award for having achieved 10,000 cash in/cash out transactions at 100 new outlets in the six months after the award was announced. On October 11, 2010, Voilá's T-Cash received 89 percent of the first scaling award, a total of $889,000. By the end of 2011, over 800,000 Haitians had signed up for mobile money services; of these, between 6000-9000 were in development programs at any given time.[4]

Research methods

We conducted our research in three phases from 2010-2012. During Phase I (June 2010 - July 2010), before mobile money was launched, our team carried out qualitative research in Port-au-Prince (Ouest), Cap Haïtien (Nord), and Jacmel / Anse-a-Pitres (Sud-Est). In Phase II (December 2010 - May 2011), we returned to watch Haiti's new mobile money services in the first phase of the roll-out. During Phase III (February 2012 - May

[3] In April 2012, Digicel purchased Voila and by October 2012 effectively shut down Voila's service, leaving Digicel as the sole mobile money provider in Haiti. Digicel now holds an 80% share of the mobile phone market in Haiti (up from 63% in June 2012, with another company, Natcom, holding 20% (Telegeography 2012, *Digicel Haiti Completes Voila Integration*, http://www.telegeography.com/products/commsupdate/articles/2012/09/18/digicel-haiti-completes-voila-integration/, accessed August 24, 2013).

[4] Personal communication from Greta Greathouse, Chief of Party of HIFIVE, 15 February 2012.

2012), we conducted a case study on the use of phones, money, and mobile money among Haitians living on the border of Haiti and the Dominican Republic.

Observations – A significant part of our research involved observing different kinds of social situations: mobile phone use, mobile money transactions, bank lines, transport of people and goods, the spending of conditional cash grants received via mobile money, marketing activities, and so on. Just as important was the participant observation we carried out, especially in regards to mobile money use. We recorded these observations in field notes, photographs, diagrams, and audio.

Mapping – We used maps in multiple ways. We created maps of common remittance routes to record and visualize informal flows of cash. When mobile money was launched, we used maps of mobile money agent locations to test whether agents were operative. For our border case study, we sketched a map of a Haitian town as official maps poorly reflected residence patterns.

Interviews – Over the course of the three phases we conducted dozens of semi-structured interviews and hundreds of less formal ones. Given sensitivities about privacy, some of the semi-structured interviews were recorded via note-taking rather than with audio. The less formal interviews were primarily recorded in field notes.

Survey – We implemented a survey of 179 people living on the border of Haiti and the Dominican Republic. Approximately half were Haitian residents of Anse-a-Pitres in Haiti (greater town pop. 21,846), and the other half were Dominicans living across the national border in Pedernales in the Dominican Republic (greater town pop. 27,955). Survey questions concerned mobility, livelihood, use of communications technology, and use of mobile money.

Portable kit study – We conducted a subset of object-based interviews with twelve interviewees in which we asked our participants to display all of the possessions they normally carry with them, how they use these objects, and why they are more or less important. We recorded these with a combination of audio, video, photographs, and interview notes. This allowed us to better understand how mobile phone and mobile money use fits with a broad range of material practices.

THREE KEY INSIGHTS

How can different research methods be leveraged to provide insights into mobile money practices? What happens when the results of different kinds of data conflict? The following examples demonstrate some important issues that we faced during planning, research, and analysis.

Time

The maturation of mobile money markets takes time. A mobile money market in the first few months of deployment is unlikely to resemble the same market one, two, or even five years down the track. There are two fundamental reasons for this. The first regards *users* (both consumers and agents): how they use mobile money is likely to change as they learn how to use m-money services, invent new ways of deploying the platform, and respond to a growing user base (the "network effect"; see Mas and Radcliffe 2010).

The second reason concerns the *structure of the market*, especially the provision of a variety of m-money services, investment in advertising, and market incentivization. The latter provides perhaps the most striking example of how the fundamental characteristics of a market can change. Virtually all mobile money deployments around the globe have, in their early days, been supported by not-for-profits such as the Bill & Melinda Gates Foundation, USAID, and a range of NGOs who use mobile money to deliver aid such as conditional cash grants. These injections of short-term cash affect both how MNOs deliver mobile money services, and how users integrate mobile money into their lives. Hence looking at mobile money markets before and after they achieve scale will give a vastly different picture.

Temporal considerations therefore have significant implications for methodology. Any research that sets out to collect "snapshots" of mobile money at a particular point in time should use methods that are appropriate to the stage of the deployment. In the early stages in particular, meta-data may not give an accurate picture of how mobile money is being used. Furthermore, it suggests that snapshots from a single point in time are not sufficient for understanding the larger picture of mobile money. Rather, this requires longitudinal and repeat studies.

Our research demonstrated just how crucial issues of timing can be in the research process. In January 2011, Baptiste and Taylor took to the streets of Port-au-Prince to find out how Haitians were adopting, and adapting to, their brand new mobile money services. Armed with GPS data about agent locations throughout Port-au-Prince, we set off to find official mobile money agents and test whether they were working or not. At that early stage of deployment, mobile money agents only existed in Port-au-Prince, although during the four months of our research they began appearing in major towns throughout the country.[5] We systematically visited dozens of TchoTcho Mobile and T-Cash agents in the city, but found few that were functioning with any regularity–or indeed at all. We phoned Digicel and Voilá to ask for up-to-date lists of functioning agents. Still, we could not find many of the stores we searched for. The vast majority of stores we visited displayed official mobile money signage, but in most cases we were not able to successfully test their systems. Some stores told us that they were not yet set up for mobile money: they had attended training but were waiting for approval and to receive their special agent SIM card. Over the course of our research, we found a handful of agents that operated reliably, and tested out mobile money at each of them.

[5] According to Digicel's website, there are now 18,760 TchoTcho Mobile agents in Haiti (http://digicelhaiti.com/tchotcho/en/find-an-agent.html, accessed 29 August 2013).

While this scenario was at least partially a teething problem particular to the early stages of deployment, it alerted us to a far more serious set of issues regarding agent operations. To delve deeper, we interviewed various agents to assess their modus operandi and identify potential problems.[6] In some SMEs that did have a functioning mobile money service, the business owner kept the phone in his/her possession and was the only person to do transactions. In other SMEs, one or more members of staff were trained to do mobile money transactions. In yet another model, agents were placed in stores by another company. All of these scenarios contributed to a significant level of unreliability for customers. The point of mobile money is that it should lower the transaction costs and actual costs of banking. In Haiti, it is not uncommon for a single bank transaction to take hours to complete, and sending remittances informally can take hours or even days where money travels from hand to hand. If aspiring mobile money users cannot find an operating agent, then uptake will be slow.

A related problem we discovered is that agents do not necessarily go through official procedures before they start operating. By law, all mobile money agents must be registered businesses. However, we discovered cases of registered businesses that were signing up to be mobile money agents, but allowing people with unregistered businesses to trade in their name. A similar problem exists with users: while ideally every individual should sign up for mobile money with their own SIM card, we discovered people who were using mobile money on a regular basis, but the SIM card was registered in someone else's name.

These issues are not trivial. Security has been a major concern for regulators, banks, MNOs, and others who have planned, permitted, and implemented mobile money systems. A major attraction of mobile money over existing informal systems is that the movement of cash can be better tracked. Practices of sharing SIMs, phones, and even business licenses may ultimately prove to be fairly harmless relative to the benefits that mobile money provides, but the risks associated with these practices need to be taken into account.

When we returned to Port-au-Prince in 2012, the agent landscape had altered significantly. Most of the mobile money agents we had tested one year earlier were no longer there. Instead, a new swathe of businesses had signed up for mobile money, and far more Digicel agents were offering mobile money services. This reinforced our view of the importance of time to the development of mobile money: the early adopters may not necessarily be the long-term users, whether as agents or customers. A snapshot can be immensely useful in identifying potential, serious problems, but repeat study is needed to know whether these kinds of problems are endemic or particular to the early stages of mobile money markets.

Trust

Trust is a major factor in the successful scaling of mobile money (Mas and Radcliffe 2010). To sign up for mobile money and make transactions in an agent or on their phone,

[6] Espelencia Baptiste, a PI on our team, originally wrote about this topic in an article entited "Not all agents are created equal", IMTFI website, 14 March 2011, http://blog.imtfi.uci.edu/2011/03/not-all-agents-are-created-equal.html.

users need to be confident that the system will work as claimed, and that they will not be exploited. This is as true for individual customers as it is for mobile money agents or businesses with merchant accounts. Social proof can go a long way in engendering trust and facilitating uptake: as Mas and Radcliffe suggest, customers sign up when they see their friends and family using mobile money, and stores will apply to be agents when they see others making a profit. However, the question of trust is more complex than of simple emulation. Our research suggests that there are different layers of trust that impact mobile money use in different ways.

The first port of call is the providers – in the case of Haiti, the MNOs who administer mobile money accounts, and their partner banks who hold the cash. A report issued by InterMedia in 2011 presented one finding in particular that fascinated us. Their survey of 1,008 Haitians showed that MNOs command significantly more trust than other Haitian institutions. While 65 percent of Haitians trust mobile phone operators "much/very much," only 43 percent trust banks to the same extent, 42 percent trust the Central Bank of Haiti, 37 percent trust international NGOs, 14 percent trust electronic payment services, and just 8 percent trust the Haitian government.

This parallels our research finding that the level of trust for MNOs is very high. Haitians we interviewed in a post-earthquake camp in Pétionville were strikingly positive in their sentiments towards Digicel–so much so that they may even sign up for any new product that Digicel offers, regardless of whether they understand what they are or need them. One man told us, "I don't know what mobile money is, but if it is Digicel, then I will sign up for it."[7] Just as in the early days of Digicel in Jamaica (Horst and Miller 2006), Digicel appears to have the potential to attract customers by brand loyalty alone, regardless of the product offered, and garner an extraordinary level of trust, the unanimity of which would be difficult for any political leader to achieve. When we were conducting research in the Iron Market in downtown Port-au-Prince, numerous vendors mistakenly thought we were Digicel employees and felt the urge to thank us for helping to construct their market.[8] "Long live Digicel!," exclaimed one elderly woman while grasping my hand. Another equally elderly woman proclaimed that God sent Digicel to save Haiti, and that Digicel should be President of the country. These are not just isolated comments: as the anthropologist Timothy Schwartz notes, "If Digicel could run for President of Haiti [….] it would win" (in Reitman 2011).

Crucially, our data suggest that distrust of banks is unlikely to significantly impact mobile money adoption, because people associate mobile money with MNOs. However,

[7] This was also suggested by our research in Phase I (2010), in which our interviewees generally expressed enthusiasm at the possibility that mobile money would soon be provided. They particularly valued the heightened temporal efficiency and reduced costs they anticipated it would bring (Baptiste, Horst and Taylor 2010).

[8] In January 2011, the historic Marche en Fer (Iron Market) was re-opened after being refurbished with funding from Digicel. See http://www.nytimes.com/2011/01/11/world/americas/11haiti.html?pagewanted=all&_r=0.

InterMedia's report indicates that while most Haitians have heard about mobile money[9] (especially through the radio or television advertisements), this familiarity does not necessarily translate into an understanding of what mobile money actually is (InterMedia 2011, 31). Hundreds of thousands of Haitians were registered for mobile money at the time we conducted our research, yet our mapping, testing, and observations suggested that just a small fraction of Haitians were using mobile money with any regularity. While we certainly found that people using mobile money were generally using agents they were already familiar with, there is no way to generalize about the motivations of registered non-users. A broader longitudinal study is needed to determine to what extent trust of agents, technology, or other factors influence usage, and the effects of social proof in overcoming these blockages.

Interestingly, we also found that a *lack* of trust can facilitate mobile money adoption. As Digicel's advertisement showing a woman hiding her money indicates, Haitians may sign up for mobile money when they do *not* trust their fellow human beings. We observed a prevalence of what we termed "Me2Me" payments in which users would deposit money in their m-money account to avoid having to store it in their homes or carry it around town (see Taylor, Baptiste and Horst 2011). We also found people who used mobile money because they did not trust themselves. Josué, an artist, explained to us, "If I have money in my pocket, I will use it on beer, cigarettes and women, but if it is not there I cannot spend it as fast. After all, money is the devil, it makes you do crazy things."[10] Indeed, it is worth noting that Josué views money itself with suspicion. Constraining money by dematerializing it–putting it in an electronic account–is a way of controlling money's autonomous power and harnessing it for one's own benefit.

While a high level of trust for MNOs may be an initial factor in compelling Haitians to register for mobile money, other levels of trust may have significantly different effects. This is a clear case in which macro data and micro data create a far clearer picture when analyzed together.

Traces / Trajectories

The beauty of M-Pesa's Kenyan advertisement showing money flying through the air is that we know it is a fiction. Money does not move by itself. It moves *via* the actions of people, it moves *through* the mediation of technologies, and it moves *with* people and other goods. Furthermore, money, people, and objects often travel together along similar trajectories. Tracing how they accompany one another along well-trodden or novel pathways is crucial to understanding what makes mobile money attractive to users as a means of circulation.

In 2010 and 2012, Taylor and Horst conducted a case study on the border of the Dominican Republic and Haiti. We wanted to know what happens to the circulation of money, people, and objects when they encounter the obstacle of the national border.

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[9] InterMedia state that 80% of their respondents had heard of mobile money, and 70% could correctly identify which MNOs offer mobile money services (2011, 23).

[10] Originally published by Espelencia Baptiste on the IMTFI blog, http://blog.imtfi.uci.edu/2011/10/02022011-resisting-devil-using-mobile.html.

Borders are more porous for some mobile objects than others. We carried out our fieldwork in Anse-a-Pitres (Haiti) and Pedernales (Dominican Republic), whose town centers are just two kilometers apart. At this particular border crossing, people did not have to show any identification to cross if they were not intending to travel beyond the border region. Mobile phone towers broadcast signals for up to forty kilometers inside their neighboring countries, so Haitians visiting the Dominican side could still use their Haitian SIM cards to make calls in Haiti. The Haitian currency, the gourde, was not accepted in Pedernales, but the Dominican peso circulated freely in Anse-a-Pitres. Furthermore, TchoTcho Mobile, which is solely Haitian, facilitated the flow of money across the national border.

To understand the circulation of people, objects, and money across the national border, we undertook a survey, mapped the towns, mapped formal and informal remittance routes, recorded interviews, and studied the ownership and movement of objects in a portable kit study. These allowed us to understand people's trajectories–the movement of themselves, their possessions, and their money through physical space and across the national border. Traces of these movements were visible in the objects people carried, including national identity cards and money, and also in their mobile phones (call histories, address books and records of mobile money transactions in text messages).

We conducted our survey of 179 people in May 2012, approximately three months after TchoTcho Mobile was launched. We found that approximately 92 percent of residents owned mobile phones, and there was little difference between the Haitian and Dominican towns. What *did* differ, however, is that there were 16 percent more SIM cards among the Haitians population than among the Dominicans, and these extra SIM cards were all held with Dominican MNOs (Claro and Orange). This is because Haitians spend far more time working, trading, and socializing in the Dominican Republic than Dominicans do in Haiti–a reflection on the Dominican Republic's greater wealth. Where possible, Haitians maintain SIM cards for both Haitian mobile networks and Dominican mobile networks so that they can pay local, rather than international, call costs.

Our data show that 75 percent of the SIM cards owned by Haitians were with the Haitian MNO Digicel, which meant that they potentially had mobile money capability. But just 4 percent of our respondents said that they had used the service. In our pre-mobile money study in 2010, our respondents had been enthusiastic about the possibility of using mobile money (Baptiste, Horst and Taylor 2010). Our interviewees told us that they would welcome a service that allowed them to avoid long bank lines, the high fees of money transfer offices, and the security risks incurred in sending money informally (albeit at no cost) via open fishing boat. In February 2012, Digicel's TchoTcho Mobile arrived to Anse-a-Pitres, with the microcredit institution Fonkoze acting as the sole TchoTcho Mobile agent. Why, when we did our survey three months later, were there not more people using mobile money, if the need was so great?

To answer this question, we turned to the data we had collected using qualitative methods. First, we went looking for the mobile money agent by asking people on the streets of Anse-a-Pitres to direct us. Approximately a dozen people erroneously sent us to Western Union and a range of *PapPadap* (Digicel phone top-up) agents before we found someone who knew that Fonkoze was the TchoTcho Mobile agent. Fonkoze did not display any TchoTcho Mobile signage at all. Waiting time to be served was approximately half an hour,

but our transaction went smoothly. These forays made us aware of some of the barriers to adoption, especially a complete lack of advertising material and signage.

Once we had located users, we implemented interviews, including an object-based interview method called a "portable kit study" (see also Ito, Okabe and Anderson 2009). These involve asking interviewees to take out every object they are carrying in their pockets, bags, and wallets, and display them on a table. Interviewers ask about each object, how and when they use each object, and its purpose in the interviewee's life. The mobile phone was a particularly productive object for data collection, often taking up fifty percent or more of the total interview time. It enabled us to see traces of phone calls and movements of people. We asked interviewees to go into their phone's history and tell us the last three people they had called, and the last three people who had called them. The people named were often relatives or friends who had been mentioned in relation to other possessions, such as photographs, documents, or gifts.

One interviewee in particular, Emmanuel, gave us a clear sense of how the mobile phone and mobile money help Haitians leverage the benefits of living on border, but also gave us an insight into how people could fail to adopt a service of significant utility. Emmanuel was a Haitian but resided on the Dominican side of the border. He used his motorcycle to make a living, ferrying Haitian passengers around town and running errands. He almost always carried with him a backpack from the Haitian MNO Voilá, multiple forms of currency, and his wallet with a fake Dominican ID card inside it. He also had a notebook in which he recorded phone numbers as a backup in case he lost his phone (a common practice). He owned just one Digicel phone, but he had two Digicel SIM cards.

Emmanuel reported that one of his cousins regularly sent him money for her Sky cable television bill, which had to be paid in Pedernales (Dominican Republic). However, she lived eighty kilometers away in Jacmel (Haiti), so she sent the cash informally, via boat. She told Emmanuel about mobile money and asked him to sign up so that she could send him the money electronically, as TchoTcho Mobil was available in Jacmel. Emmanuel did not know how the system worked, so he asked a friend to help him. His friend registered a SIM card with TchoTcho Mobile at Fonkoze and gave the SIM to Emmanuel. Hence Emmanuel owned one SIM in his own name, which he used to make calls and send texts, and one SIM in another person's name, which he only used for mobile money transactions. Emmanuel and many other people we spoke with also shared mobile phones, indicating that mobile phone usage is not necessarily ego-centric. These sharing practices are important to keep in mind when analyzing "big data."

We feel that the key to unlocking the mobile money puzzle is the intersection of trajectories and traces. When mobile money arrived to Anse-a-Pitres, the town already possessed many ways of moving money, goods, and people by both formal and informal methods. The trajectories they follow are well-established travel and trade routes that are decades, possibly centuries, old. They are also highly visible to the people who use them, although outsiders may not easily be able to read the traces that are left in the wake of mobile people, objects, and cash.

Given near-universal phone ownership and the existence of a need to send money, mobile money should have complemented these existing trajectories. The problem was that as yet it had left very few traces in the local landscape. With just a handful of users and no

advertising, mobile money remained invisible to the town's population. Television advertisements, such as TchoTcho Mobile's depiction of an elderly woman hiding her money, barely reached this corner of the country where few people have electricity. This suggests that, as important as social proof is in driving mobile money adoption and literacy, branding will also be of crucial import to mobile money adoption in Haiti.[11]

FUTURE DIRECTIONS

The power of ethnographic methods lies in their ability to demonstrate the differences between what people *say* they do, and what people *actually* do. In the case of mobile money, where we are trying to gain insights into the micro-world of users as well as understand the aggregate picture, deploying a full suite of ethnographic methods can help us tell the difference between how people are *assumed* to use a system, and how they *actually* use it.

We would like to see more multidisciplinary work that plans an integration of methods from the outset–how will how different methods complement each other, compensate for blind spots, and so on? What are the barriers in terms of accessing insider information for different methods? What kind of partnerships and collaborations may need to take place to gain a richer understanding of mobile money in practice? To what extent do "in the moment" snapshots need to be integrated with longitudinal (or longitudinally-motivated) studies of mobile money use over time? What kind of value do other perspectives–understandings of historical trade routes, practices such as patronage, and everyday financial behaviour (such by as market vendors)–bring to mapping and surveys?

Finally, we suggest that in order to choose the right methods and approaches to mobile money *use*, we need to take a broad view of what mobile money *is*. Simultaneously a commodity and a social good, mobile money is attractive to a broad range of users and applications. It incorporates the qualities of money, and therefore lends itself readily to both quantitative and qualitative analysis. Furthermore, a view of mobile money as a socioeconomic development tool could benefit from viewing mobile money as part of material culture, given that possessions have a high level of import in the lives of the poor (Taylor 2013). Understanding its broad nature will help us ask the right questions and choose the right combination of methodologies.

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[11] A view that was also communicated to us by Michael Joseph, ex-CEO of Safaricom who oversaw the development of M-PESA, during his visit to Haiti in 2011.

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